What is claimed is:

1. A method for the production of metal chips comprising the steps of:

i) providing a mixture of a metal alloy powder with a foaming agent powder, said foaming agent having a given decomposition temperature above which the foaming agent decomposes into gas, and said powders comprising finely dispersed solid particles;

ii) pre-compacting the mixture of step i);

iii) heating the pre-compacted mixture of step ii) to a temperature below said decomposition temperature and at which permanent bonding of the particles can occurs;

v) hot compacting the mixture obtained in step iii) for producing a compacted body made of a metal matrix embedding the foaming agent; and

vi) reducing the compacted body into metal fragments and thereby obtaining foamable metal chips.

2. A method as defined in claim 1, wherein the step i) of providing the metal alloy powders and the foaming agent powder comprises the step of:

-disintegrating metal scraps, metal particles or metal chips into said metal alloy powder.

3. A method as defined in claim 1 or 2, comprising, after step vi), the steps of:

-heating the foamable chips to a temperature below a liquidus temperature of said metal alloy and sufficient to make the metal chips plastic; and

-extruding the heated metal (chips) body for producing a foamable metal wire.

4. A method as defined in claim 3, comprising after the step of extruding, the step of:

cutting the wire into smaller foamable wire segments.

5. A method as defined in claim 1 or 2 for producing porous metal pellets, comprising the additional step of:

vii) heating the foamable metal chips obtained in step vi) to a temperature above said decomposition temperature of the foaming agent.

6. A method as defined in claim 5, comprising, prior to step vii) of heating the metal foamable metal chips, the step of:

-mixing said foamable metal chips with other powders.

7. A method as defined in claim 6, wherein the other powders are made of refractory material powders.

8. A method as defined in claim 7, comprising, prior to mixing the foamable metal chips with the refractory material powders, the steps of:

-heating the foamable metal chips to a temperature below a liquidus temperature of said metal alloy and sufficient to make the metal chips plastic; and

-shaping the metal chips into metal granules.

9. A method as defined in claim 8, wherein the metal granules are spherical.

10. A method as defined in claim 9, wherein the step of shaping the metal chips into metal granules comprises the steps of:

-dispersing the heated chips as a monolayer on a flat heated surface;

-applying a heated plate over said monolayer, and shaping the metal granules by simultaneously applying pressure with the heated plate and performing circular movement with the same.

11. A method as defined in any one of claims 1 to 9, comprising, after step vi) of disintegrating, the step of:

-classifying the metal chips by grain sizes.

12. A method as defined in claim 11, wherein the grain sizes range from 1,5mm to 40mm.

13. A method as defined in any one of claims 1 to 12, wherein the metal powders are aluminum alloy powders.

14. A method as claimed in any one of claims 1 to 13 wherein the foaming agent is selected from the group consisting of TiH_2 and $CaCO_3$.

15. A method as claimed in any one of claims 1 to 14, wherein the step v) of hot compacting is hot rolling.

16. Use of porous metal pellets as defined in any one of claims 5 to 10, as fillers for a material selected form the group consisting of a polymeric material, a soundproof material, a fireproof material and a shock absorption material.

17. Use of porous metal pellets as defined in claim 16, wherein the polymeric material is a resin.

18. A method for the production of a metal product comprising the steps of:

a) providing metal pieces and reducing said metal pieces into smaller metal particles;

b) mixing the metal particles with an additive having a decomposition temperature that is greater than a solidus temperature of said metal particles;

c) pouring the mixture of step b) into a closed volume metal shell having a given thickness and providing the metal shell with at least one passage for gases to escape;

d) increasing the density of the metal shell with powder by applying pressure;

e) heating the metal shell to a temperature above a temperature equal to said solidus temperature minus 50-60 degrees Celsius and below said

decomposition temperature of the additive, and immediately applying pressure on the metal shell sufficient to compress the metal particles and to create micro shear conditions between the metal particles so as to obtain a dense metal product.

19. A method as defined in claim 18, comprising, prior to step c), the step of:

pre-compacting the mixture of step b).

20. A method as defined in claims 18 or 19, wherein the additive is a foaming agent that decomposes into gas at a temperature greater than said decomposition temperature.

21. A method as defined in claim 20, wherein the foaming agent is selected from the group consisting of TiH_2 and $CaCO_3$

22. A method as defined in claim 20 or 21, comprising, after step e), a step of heating the dense metal product, with or without the metal shell, to a temperature greater than the decomposition temperature of the foaming agent, for obtaining a foam metal product.

23. A method as defined in claim 19, wherein the step of pre-compacting the mixture is performed by vibration.

24. A method as defined in any one of claims 18 to 23, wherein, in step e), the pressure is applied by hot rolling the metal shell.

25. A method as defined in any one of claims 18 to 24, wherein, in step e), the hot rolling is performed with a compression force sufficient for obtaining a 95-100% dense metal product.

26. A method as claimed in any one of claims 18 to 25, wherein the closed volume metal shell comprises two continuous longitudinal main surfaces with side edges, and is deformable in a cross direction.

27. A method as defined in claim 26, wherein the continuous surfaces are at least partially closed at their side edges, said partial closing being made by a process selected from the group consisting of welding, bending, clamping and bonding.

28. A method as claimed in claim 26 or 27, wherein the hot rolling of step e) is performed by at least one roll moving along one of said surfaces of the shell.

29. A method as defined in claims 18 or 19, wherein the closed volume metal shell is obtained by providing a flat pan with a lid; and wherein step c) comprises the steps of pouring the mixture into the pan and closing the lid of the pan leaving said at least one passage.

30. A method as claimed in any one of claims 18 to 29, wherein step d) of increasing the density of the metal shell comprises the step of cold rolling the metal shell.

31. A method as defined in any one of claims 18 to 30, wherein the metal pieces are made of recycled aluminium scraps.

32. A method as defined in any one of claims 18 to 31, wherein the smaller particles of step a) are metal chips, a powder of finely dispersed metal particles, agglomerated powders or particles.